



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,180	11/21/2001	Evelyn Duesterwald	10011613.1	9426

7590 03/11/2005

HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER

PHAM, CHRYSTINE

ART UNIT	PAPER NUMBER
----------	--------------

2122

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/989,180	<b>Applicant(s)</b> DUESTERWALD ET AL.	
	<b>Examiner</b> Chrystine Pham	<b>Art Unit</b> 2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 November 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>21 November 2001</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. This action is responsive to application 09/989180 filed on November 21<sup>st</sup> 2001. Claims 1-18 are presented for examination.

***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless –*

*(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.*

4. Claims 1-5, 7, 9-13, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by D'arcy et al. (US 6467082), hereinafter, *D'arcy et al.*.

**Claim 1**

*D'arcy et al.* teach a method of producing a translator for computer executable instructions, the method comprising:

- o programming replacement code segments (i.e., functions) in said translator (e.g., see 202 FIG.2A & associated text) in a high level programming language (e.g., see 'C' source code FIG.2A & associated text; see FIG.6B & associated text), wherein said translator is for translating computer executable program code from code for a first instruction set (e.g., see *first processor* col.3:35-46) to code for a second instruction set (e.g., see *second processor* col.3:35-46), said

Art Unit: 2122

replacement code segments/functions for replacing portions of said code for a first instruction set (e.g., see *code, optimized, host platform* col.3:35-col.4:2); and

- o compiling said replacement code segments (i.e., functions) in said translator to create computer executable instructions (e.g., see 204 FIG.2A & associated text; see *compiled code, second processor* col.3:35-46).

**Claim 2**

The rejection of base claim 1 is incorporated. *D'arcy et al.* further teach wherein programming replacement code segments/functions in said translator in a high level programming language comprises programming hardware independent code segments/functions (e.g., see *C source code* FIG.2A & associated text; see FIG.6B & associated text; see *simulator, target processor, host machine, mXn* col.2:54-62; see FIG.2B & associated text; see "*mXn*" col.5:55-67).

**Claim 3**

The rejection of base claim 1 is incorporated. *D'arcy et al.* further teach wherein programming replacement code segments in said translator in a high level programming language comprises programming replacement functions in said translator (e.g., see '*C, code, function*' col.6:10-17; see *extern void(), file1\_code()* FIG.6B & associated text).

**Claim 4**

The rejection of base claim 1 is incorporated. *D'arcy et al.* further teach wherein said portions of said code for a first instruction set comprise operation codes (i.e., opcodes) (e.g., see FIG.3A & associated text; see FIG.6A & associated text).

**Claim 5**

The rejection of base claim 1 is incorporated. *D'arcy et al.* further teach wherein said translator comprises a dynamic translator (e.g., see *simulators, compilers, dynamic compilers* col.1:40-col.2:26; see 16 FIG.1 & associated text).

**Claim 7**

The rejection of base claim 1 is incorporated. *D'arcy et al.* further teach wherein programming said replacement code segments (i.e., functions) in said translator in said high level programming language comprises programming replacement code segments (i.e., functions) in the C programming language (e.g., see '*C' source code* FIG.2A & associated text; see FIG.6B & associated text).

**Claim 9**

The rejection of base claim 1 is incorporated. *D'arcy et al.* further teach wherein compiling said replacement code segments in said translator to create said computer executable instructions comprises processing said replacement code segments with a compiler designed to create computer executable instructions for said second instruction set (e.g., see 204 FIG.2A & associated text; see *target processor, native compiler, host machine* col.5:10-32; col.5:55-67).

**Claim 10**

*D'arcy et al.* teach a method of programming a translator, comprising:

- writing replacement functions in said translator (e.g., see 202 FIG.2A & associated text) in a high level programming language (e.g., see '*C' language source code* col.5:9-67; see FIG.6B & associated text) to simulate (e.g., see *simulation system 200* FIG.2A & associated text) instructions in a computer program to be translated (e.g., see *assembly language program* col.5:9-67); and
- compiling (e.g., see 204 FIG.2A & associated text) said translator to convert said replacement functions written in a high level programming language to low level computer executable instructions, so that said translator can replace said instructions in a computer program to be

translated with said low level computer executable instructions for said replacement functions (e.g., see *compiled code, second processor* col.3:35-47; see *native compiler, host machine, run-time* col.5:9-67).

**Claims 11, 12, 13, 15**

The rejection of base claim 10 is incorporated. Claims recite limitations, which have been addressed in claims 2, 4, 5, and 7, therefore, are rejected for the same reasons as cited in claims 2, 4, 5, and 7.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

6. Claims 8, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over *D'arcy et al.* in view of Tribble (Incompatibilities Between ISO C and ISO C++, <http://david.tribble.com/text/cdiffs.htm>), hereinafter, *Tribble*.

**Claim 8**

The rejection of base claim 1 is incorporated. *D'arcy et al.* do not expressly disclose wherein programming said replacement code segments in said translator in said high level programming language comprises programming replacement code segments in the C++ programming language. However, *Tribble* discloses a high level programming language being C++ programming language (e.g., see C++, or C++98 pages 1-40). It would have been obvious to one of ordinary skill in the pertinent art at the time the invention was made to substitute the C programming language disclosed by *D'arcy et al.*

Art Unit: 2122

with C++ programming language as disclosed by *Tribble*. And the motivation for doing so would have been to facilitate local variable declarations within conditional expressions such as IF, WHILE, and SWITCH statements (e.g., *Tribble* page 5, section **Conditional expression declarations**), and support more complex types (template class and template functions) than C language (e.g., *Tribble* page 12, 4<sup>th</sup> to last line; page 31, section **Returning void**). Furthermore, C++ provides better support for object-oriented programming through language features such as data encapsulation, inheritance, runtime binding as well known in the art.

#### Claim 16

The rejection of base claim 10 is incorporated. Claim recites limitations, which have been addressed in claim 8, therefore, is rejected for the same reasons as cited in claim 8.

7. Claims 6, 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *D'arcy et al.* in view of Bugnion (US 6704925), hereinafter, *Bugnion*.

#### Claim 6

The rejection of base claim 1 is incorporated. *D'arcy et al.* do not expressly disclose wherein said translator comprises a caching dynamic translator in which one or more of said replacement code segments are stored in a cache during translation so that said replacement code segments can be executed repeatedly without repeatedly replacing said portions of said code for a first instruction set during a single translation process. However, *Bugnion* discloses a caching (e.g., see 230 FIG.2 & associated text) dynamic translator (e.g., see 200 FIG.2 & associated text; see *dynamic binary translator* Abstract) in which one or more of said replacement code segments (e.g., see *input instruction sequences*, *output instruction sequences* Abstract) are stored in a cache (e.g., see 230 FIG.2 & associated text; see *translation cache* Abstract) during translation so that said replacement code segments can be executed repeatedly without repeatedly replacing said portions of said code for a first instruction set during a single translation process (e.g., see Abstract). It would have been obvious to

one of ordinary skill in the pertinent art at the time the invention was made to incorporate the teaching of *Bugnion* into that of *D'arcy et al.* for the inclusion of a caching dynamic translator. And the motivation for doing so would have been to eliminate the need for costly flushing the translation cache or retranslating (i.e., repeatedly replacing) the input instruction if only constants have changed since the original translation (e.g., *Bugnion* Abstract).

#### Claim 14

The rejection of base claim 10 is incorporated. Claim recites limitations, which have been addressed in claim 6, therefore, is rejected for the same reasons as cited in claim 6.

#### Claim 17

*D'arcy et al.* teach a method of producing a dynamic translator (e.g., see *simulators, compilers, dynamic compilers* col.1:40-col.2:26; see 16 FIG.1 & associated text) with portable run-time code synthesis (e.g., see 204 FIG.2A & associated text; see col.5:32-38), comprising:

- programming hardware independent replacement functions in a high level programming language for said dynamic translator (e.g., see *C source code* FIG.2A & associated text; see FIG.6B & associated text; see *simulator, target processor, host machine, mXn* col.2:54-62; see FIG.2B & associated text; see "*mXn*" col.5:55-67); and
- compiling said hardware independent replacement functions to produce hardware dependent computer executable replacement functions (e.g., see 204 FIG.2A & associated text; see *compiled code, second processor* col.3:35-46; see *native compiler, host machine* col.5:9-67). *D'arcy et al.* do not expressly disclose said dynamic translator being a caching dynamic translator. However, *Bugnion* disclose a caching (e.g., see 230 FIG.2 & associated text) dynamic translator (e.g., see 200 FIG.2 & associated text; see *dynamic binary translator* Abstract). It would have been obvious to one of ordinary skill in the pertinent art at the time the invention was made to incorporate the teaching of



*Bugnion* into that of *D'arcy et al.* for the inclusion of a caching dynamic translator. And the motivation for doing so would have been that, which has been cited in claim 6.

**Claim 18**


The rejection of base claim 17 is incorporated. Claim recites limitations, which have been addressed in claims 10, therefore, is rejected for the same reasons as cited in claim 10.

**Conclusion**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chrystine Pham whose telephone number is 571-272-3702. The examiner can normally be reached on Mon-Fri, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
TUAN DAM  
SUPERVISORY PATENT EXAMINER

CP

March 4, 2005